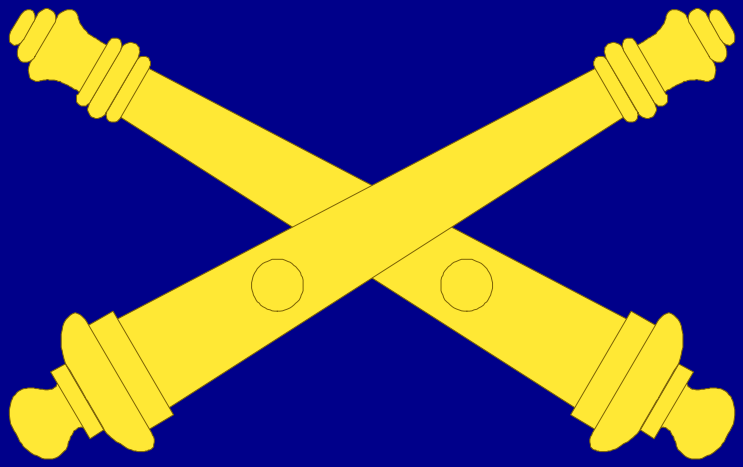
ACALA

Army Research Laboratory

Future Direct Support Weapon System (FDSWS)



Major David Scalsky

Richard S. Herman

27 April 1999

Fire Support FSAC *Armaments Center*

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Agenda

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ARDEC

- Present Status
- Emerging Light Artillery Requirements Drive Future Design
- Program Activities & Technology


M198
16,000 lb.


XM 777
9000 lb.


M119A1
4,200 lb.

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Agenda

TACOM-ARDEC

- Present Status
- **Emerging Light Artillery Requirements Drive Future Design**
- Program Activities & Technology

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Light Forces Operational Characteristics

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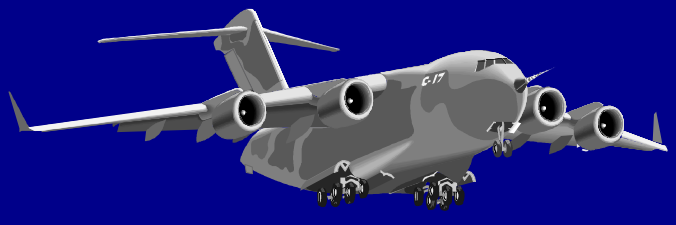

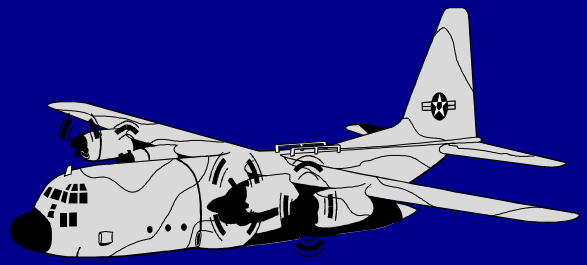

- **Force projection Armies**
  - **Requires Strategic & Tactical mobility**
- **Increase in Operations Other Than War**
  - **Early entry forces need force multipliers until heavy forces arrive (DS Artillery?)**
- **Resource constrained environments**

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Emerging Doctrine Affects Weapon Design

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- Lighter weight to meet mobility requirements
- Advanced electronics to increase survivability
- More lethal to protect friendly forces
- More reliable to increase availability
- More affordable to support

Impulse/Weight Comparison US Towed Artillery Systems

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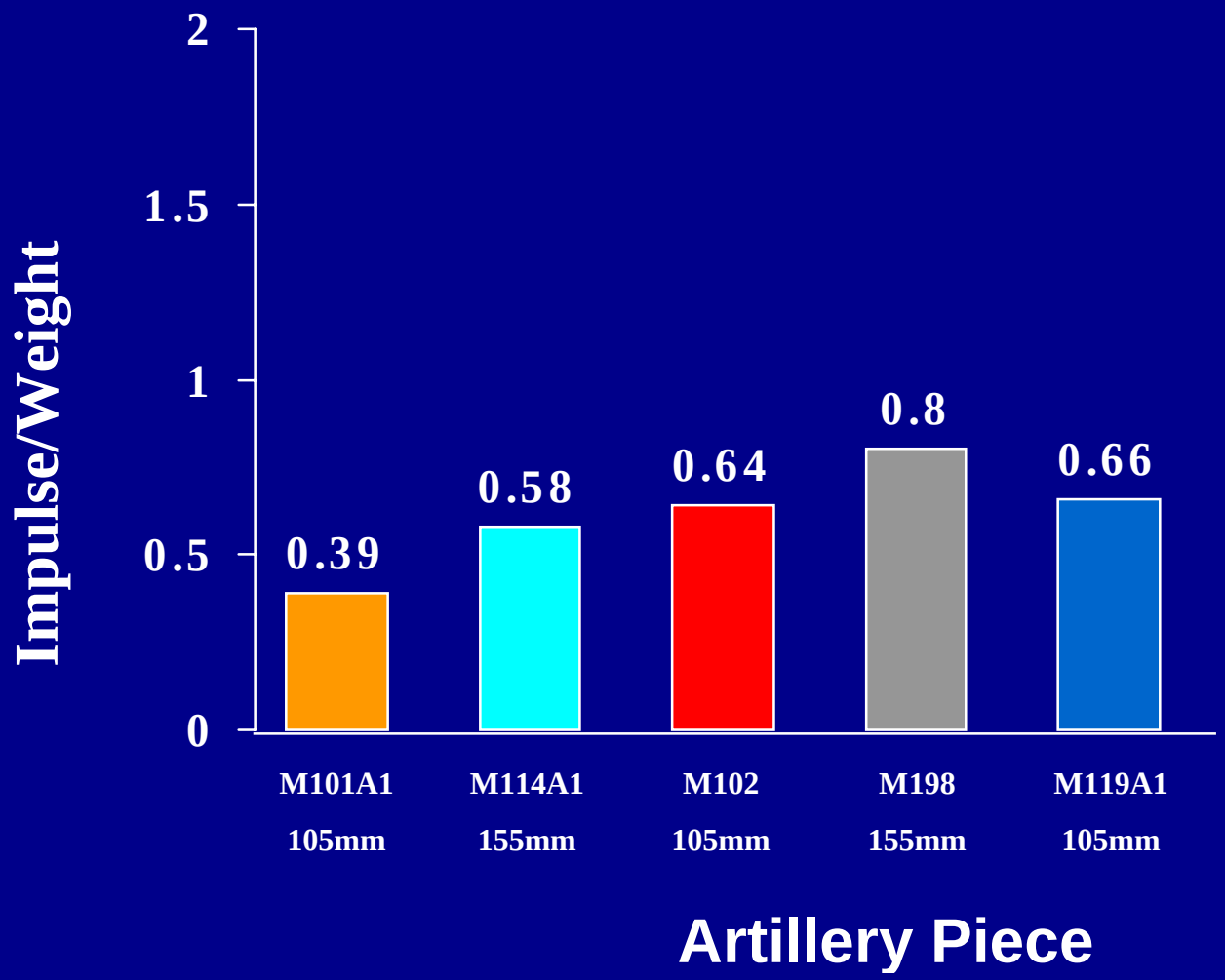

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Impulse/Weight Comparison US Towed Artillery Systems

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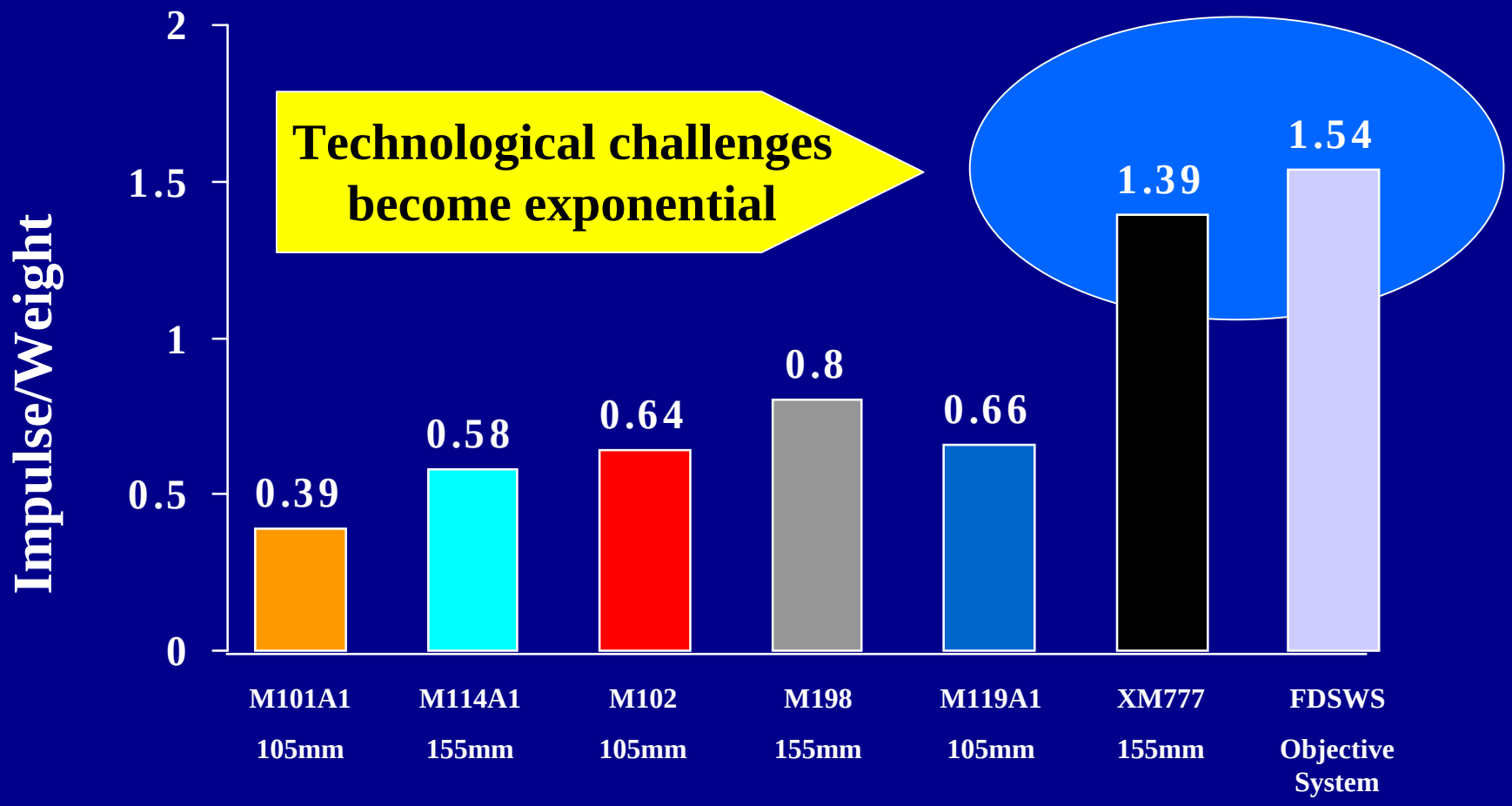

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The Design Challenge

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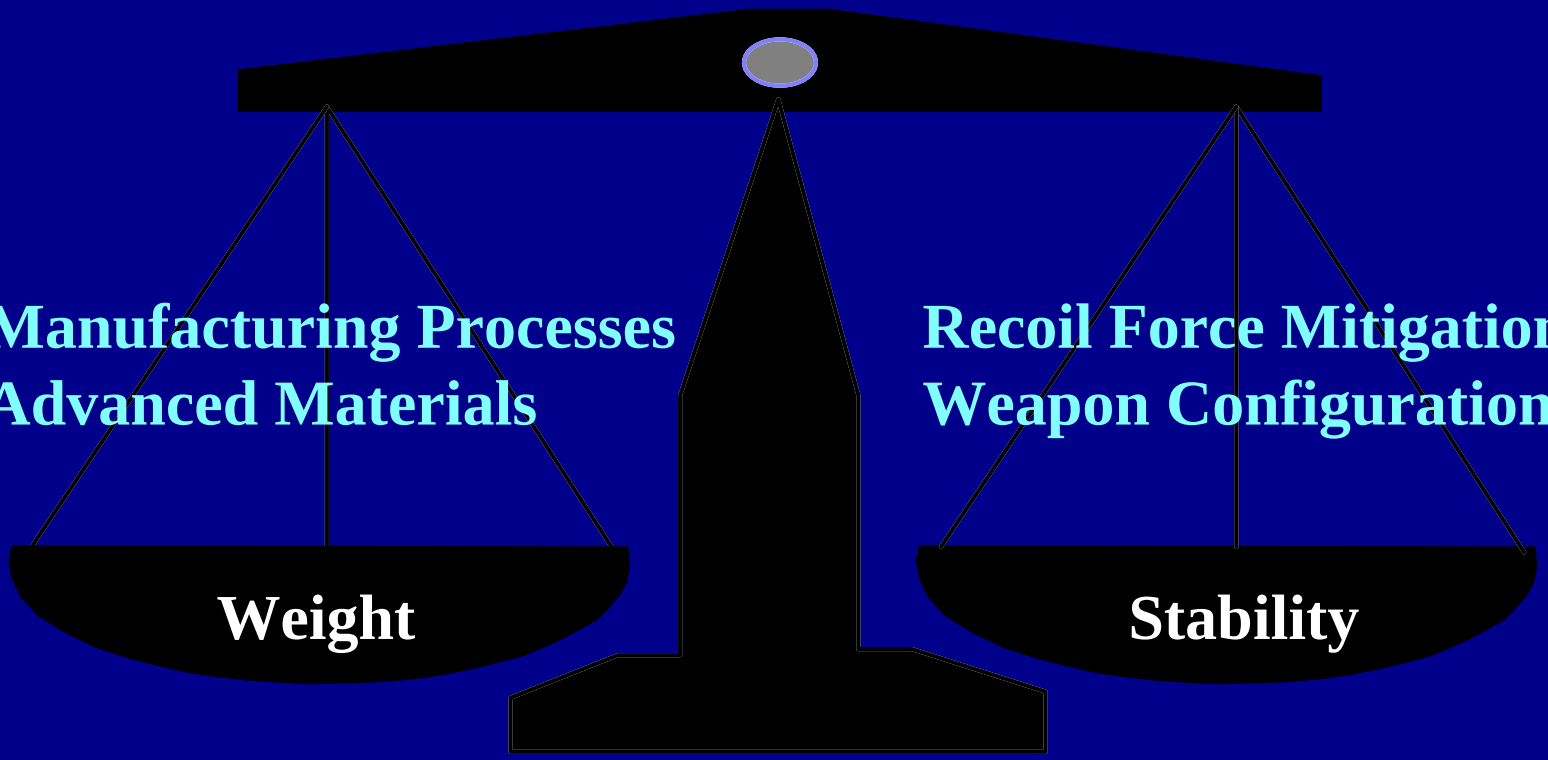

Integrating technologies without disturbing the balance

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Agenda

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- Present Status
- Emerging Light Artillery Requirements Drive Future Design
- **Program Activities & Technology**

FDSWS Program Activities & Technologies

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FY	99	00	01	02	03	04	05

Program Activities

Reqs Definition/Concept Dev | **PDRR/ATD** | **Development**

Technology Drivers

Recoil Management
- **Soft Recoil**
- **Electro-Rheological Fluid Control**

Advanced Materials & Structures

Lighter, Stable Artillery Platforms

New Industry IR&D & alternate technologies

Laser/ETC Ignition
MR Fluids
Organic Composites,
Metal matrix Composites

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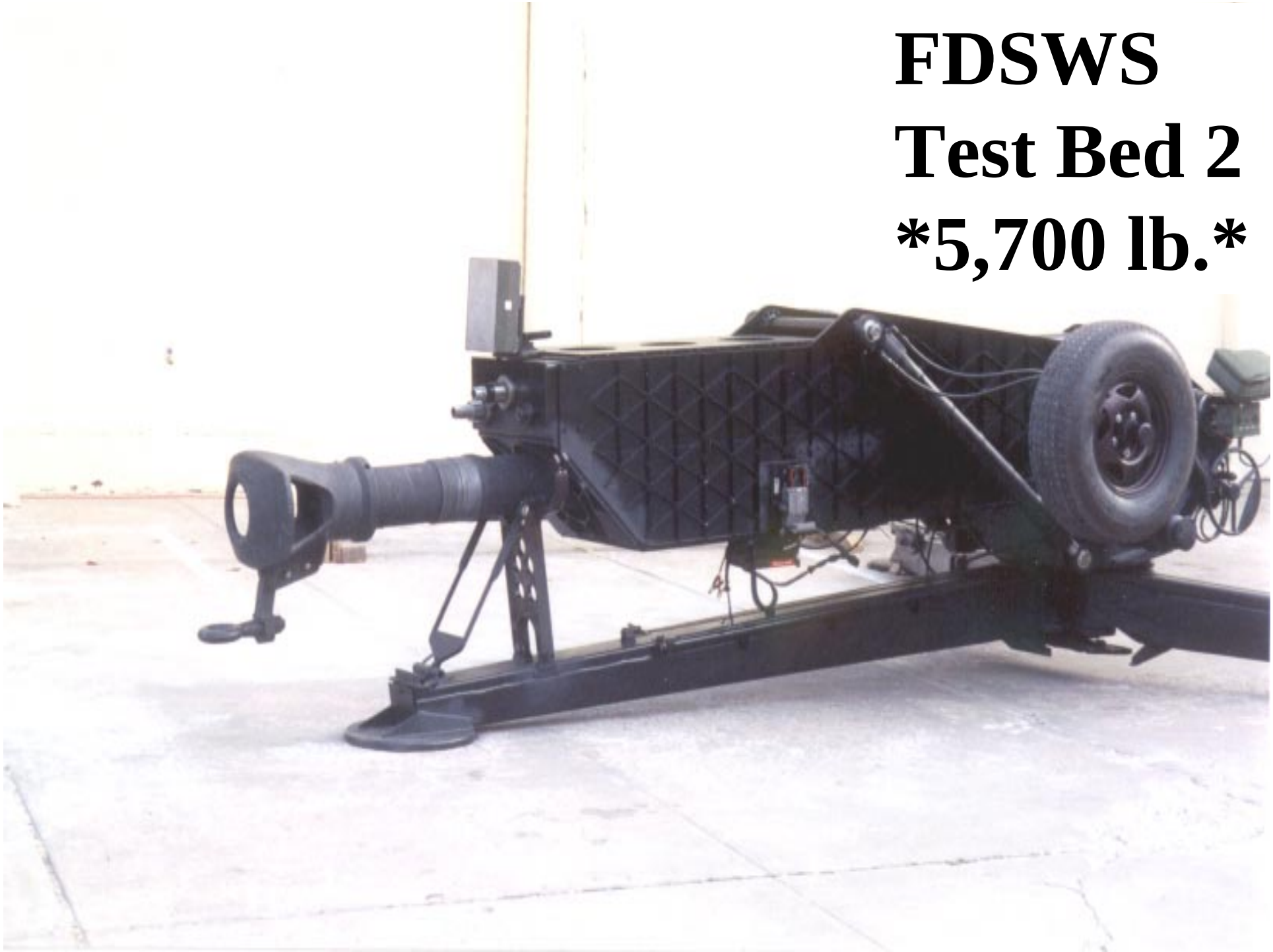
FDSWS
Test Bed 1
7,000 lb.

FDSWS
Test Bed 2
5,700 lb.



Advanced Design Techniques For Weight Reduction

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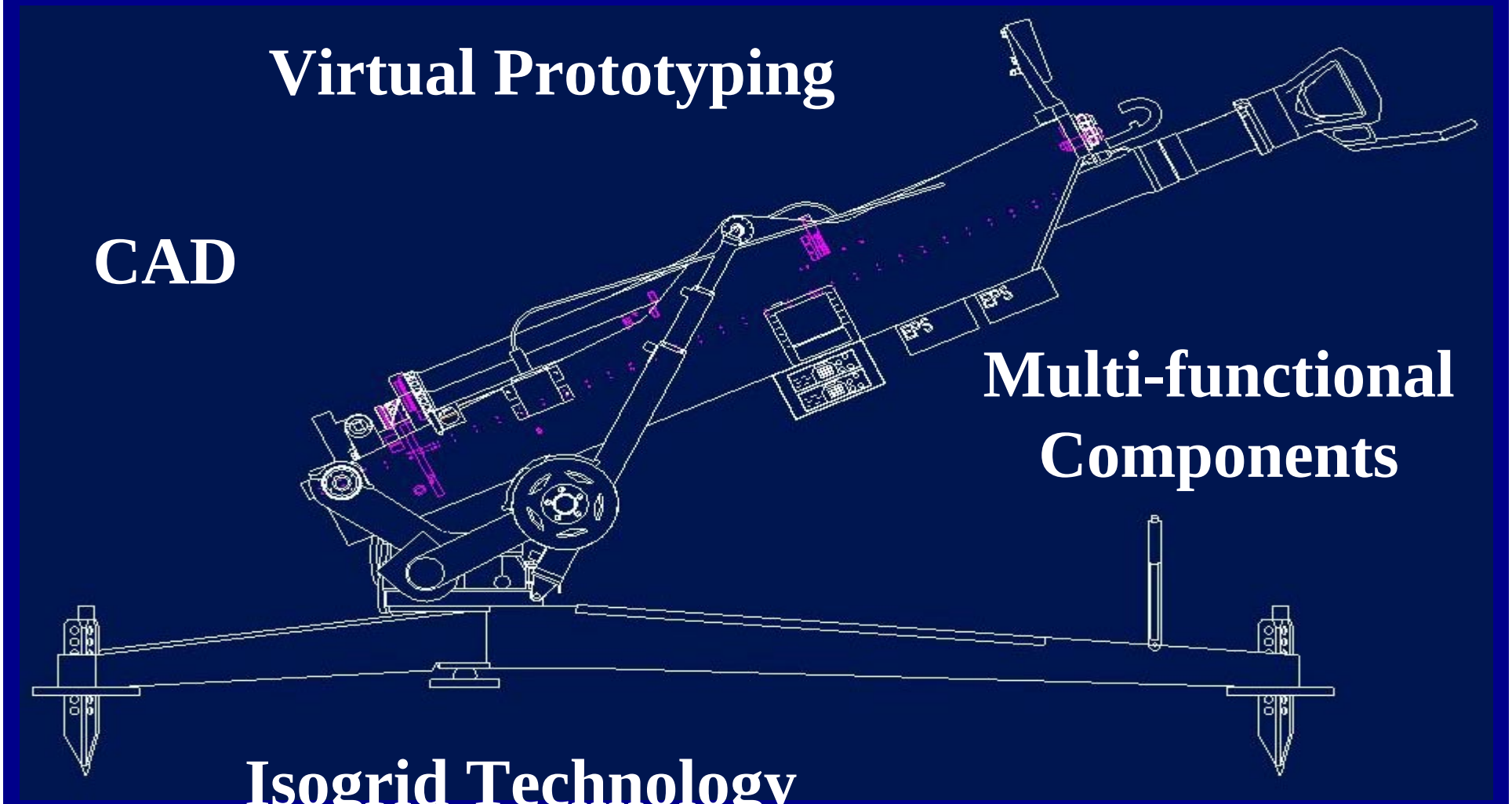

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Dynamic Model of TB2

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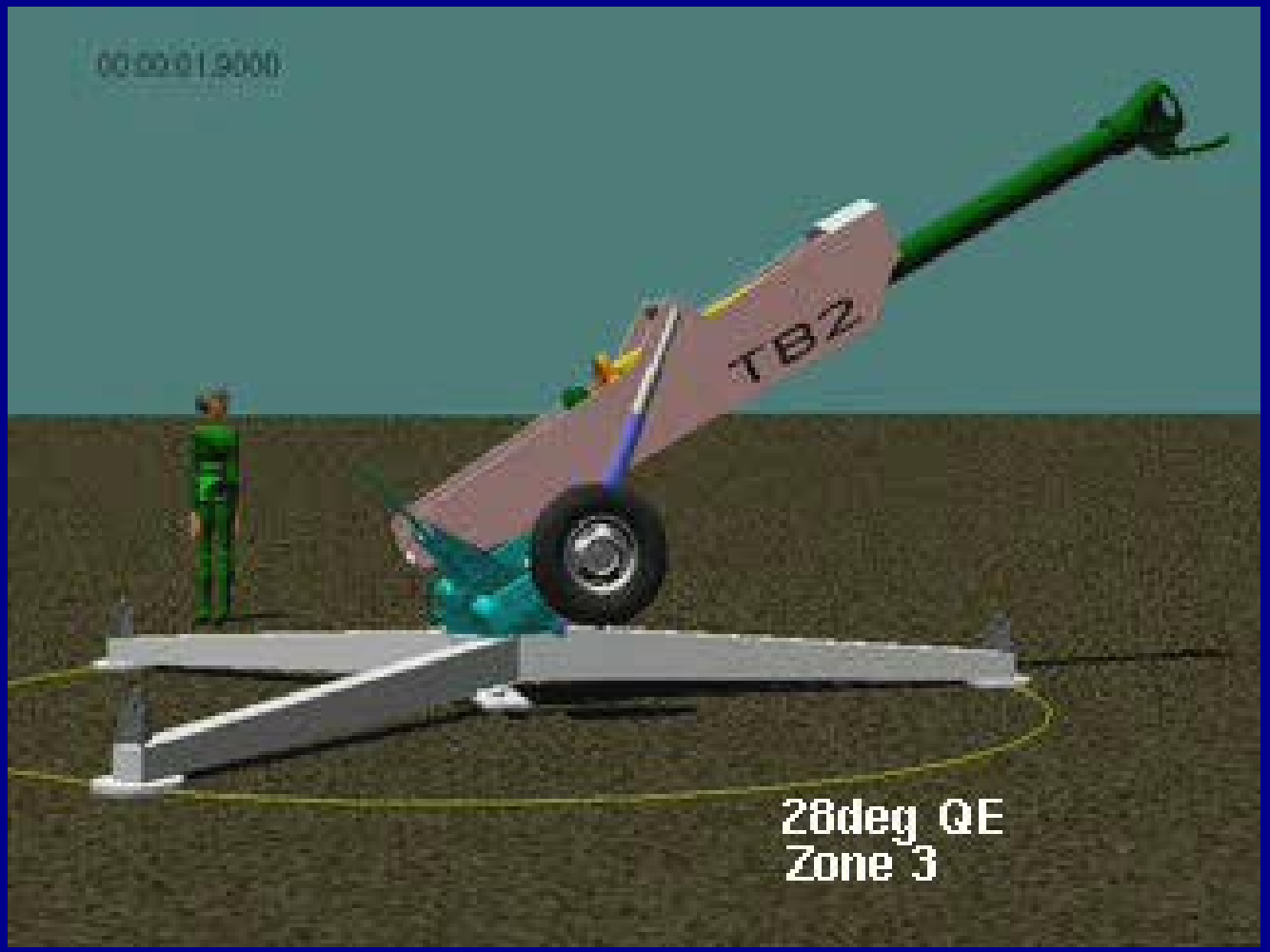

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ER Fluids

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- Suspension of particles in an insulating fluid
- Fluids which display a significant change in apparent viscosity with application of an electric field
- Change completely reversible, fast response time (<1 msec)

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Isogrid Structural Technology

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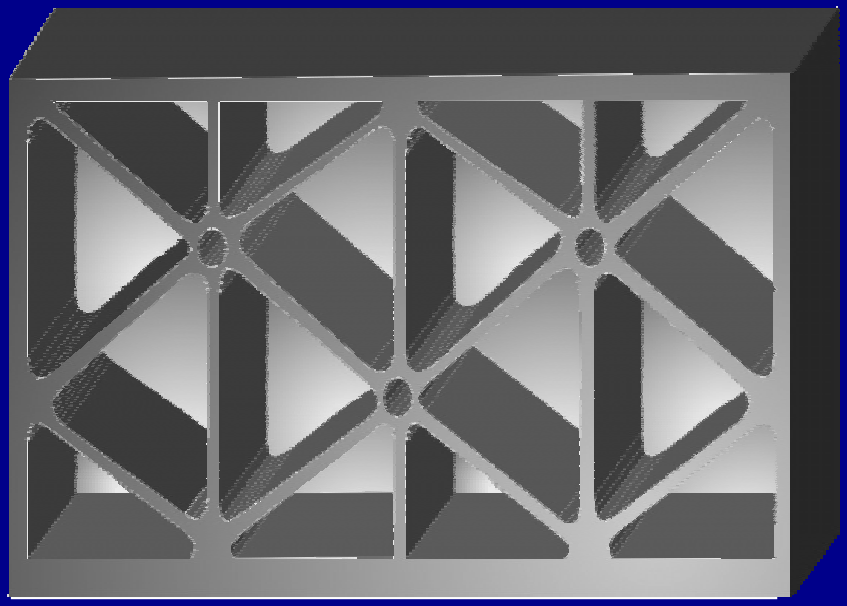

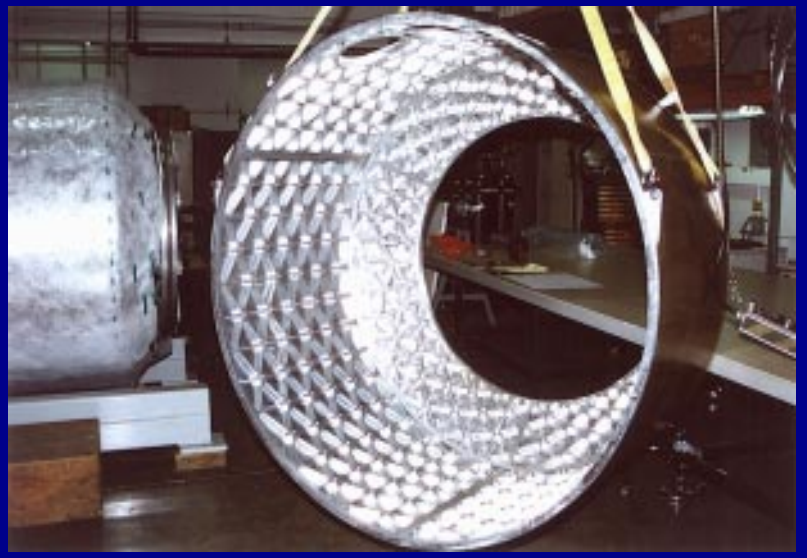

Reduces weight - maintains structural integrity

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Summary

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- Artillery must adapt to meet future needs
- Current technological exploration includes: Soft Recoil, ER Fluids & Advanced Structures
- Actively looking for new technologies to meet aggressive requirements

Lighter, Stable Artillery Platforms